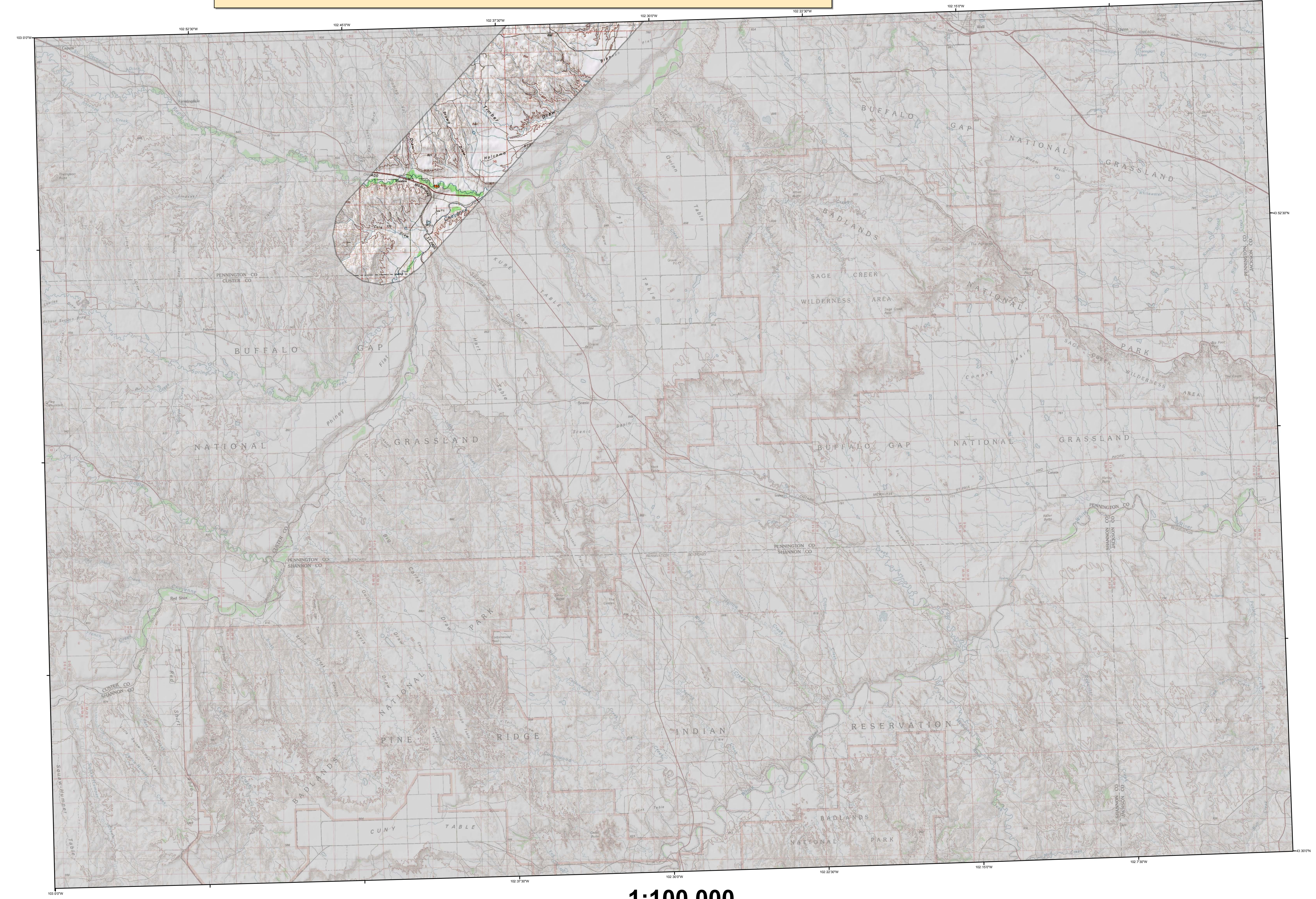


2006 Aerial Insect and Disease Survey
Wall, South Dakota
USGS 100K DRG: 43102-E1



1:100,000

Legend

Causal Agent(s)

Not Flown in 2006

Use of the Number System

Example: 5-25 = The first number before the dash is the causal agent code. The number after the dash is the number of dead "fader" trees in the polygon or point. When recent dead trees are not counted, an intensity code of L-light, M-moderate, and H-high may be used after the causal agent code. Periodically, trees per acreage estimates are used after the causal agent code instead of number of dead "fader" trees (or an intensity code). For example: 5-120A = The first number before the dash is the causal agent code. The number after the dash is an estimation of the number of dead "fader" trees in the polygon per acre. In this case it would be an estimation that, on the average, one tree per every two acres would be a dead "fader" tree. In another example: 5-3A = that on the average, an estimated three trees per acre are dead "fader" trees. A / is used as a separator when a point polygon has more than one causal agent code.

Code	Causal Agent	Primary Host	Code	Causal Agent	Primary Host	Code	Causal Agent	Primary Host
1	Douglas-fir beetle	Douglas-fir	59	Armadillo	Lodgepole Pine	106	fox rounder bagging	Cottonwood/Poplar
2	Engelmann Spruce Beetle	Engelmann Spruce	60	White pine blister rust	5-needle Pine	107	fall webworm	Cottonwood/Poplar
3	Mountain pine beetle	Ponderosa Pine	61	Deadly mistletoe	Softwoods	108	road salt	Softwoods
4	Mountain pine beetle	5-needle Pine	62	Elytrodema	Ponderosa Pine	109	pinewood nematode	Scotch Pine
5	Western pine beetle	Ponderosa Pine	63	Indusidius 605, 66 & 68	All Tree Species	110	oak wilt	Oak
6	Fire Engraver	White Fir	64	Air pollutants	All Tree Species	111	foliage disease	All Tree Species
7	Douglas-fir engraver beetle	Douglas-fir	65	Chemical damage	All Tree Species	112	spruce ips	White Spruce
8	Western balsam bark beetle	Subalpine Fir	66	Loophodermella praeusta	Softwoods	113	bedford chestnut borer	Oak
9	Unidentified bark beetle	Softwoods	67	Rhabdocline pseudotsugae	Douglas-fir	114	anthracnose like foliar disease	Bur Oak
10	Pine engraver	Lodgepole Pine	68	Loophodermella arcuata	Softwoods	115	Dieback	All Tree Species
11	Pine engraver	Ponderosa Pine	69	Leucostoma acrota	Softwoods	116	Mortality	All Tree Species
12	Pondosa pine needle miner	Lodgepole Pine	70	Loophodermella concolor	Softwoods	117	Discoloration	All Tree Species
13	Lodgepole pine needle miner	Ponderosa Pine	71	Cottoneaster pin	Softwoods	118	Heterospora	All Tree Species
14	Jack pine budworm	Jack Pine	72	Needle cast (Hypodermaceae)	Softwoods	119	Flagging	Quaking Aspen
15	Spruce budworm, light defol.	Douglas-fir	73	Root Rot	All Tree Species	120	aspen lentic	Quaking Aspen
16	Spruce budworm, medium defol.	Douglas-fir	74	Unidentified disease	Softwoods	121	Marssonina Blight	Ash
17	Spruce budworm, heavy defol.	Douglas-fir	75	Winter damage light	All Tree Species	122	Dieback (ash)	Hardwoods
18	Douglas-fir tussock moth	Douglas-fir	76	Winter damage medium	All Tree Species	200	Dieback (cottonwood)	Cottonwood/Poplar
19	Pine butterfly	Ponderosa Pine	77	Winter damage heavy	All Tree Species	201	Dieback (hardwood)	Hardwoods
20	Pine looper	Ponderosa Pine	78	Pinyon black stain	Common Pinyon	202	Dieback (oak)	Oak
21	Pine tortrix	Hardwoods	79	Pine	All Tree Species	210	Mortality (old cottonwood)	Cottonwood/Poplar
22	Tent caterpillars	Hardwoods	80	Porcupine	All Tree Species	211	Mortality (eastern cedar)	Eastern Red Cedar
23	Leaf beetles	Hardwoods	81	Fire	Softwoods	212	Mortality (hardwood)	Hardwoods
24	Oak leaf roller	Hardwoods	82	Winterthrow	All Tree Species	213	Mortality (oak)	Oak
25	Pine needle-sheath miner	Ponderosa Pine	83	High water damage	All Tree Species	214	Mortality (spruce)	Spruce
26	Pine sawfly	Ponderosa Pine	84	Avian damage	All Tree Species	220	Discoloration (ash)	Ash
27	Pine tussock moth	Ponderosa Pine	85	Aspen decline-multiple agents	Quaking Aspen	221	Discoloration (cottonwood)	Softwoods
28	Carabidworms	Hardwoods	86	Juniper mortality-unknown agents	Juniper	222	Discoloration (cottonwood)	Cottonwood/Poplar
29	Variable oak leaf caterpillar	Hardwoods	87	Gambel oak decline-unknown agents	Gambel Oak	223	Discoloration (eastern cedar)	Eastern Red Cedar
30	Unidentified defoliator	All Tree Species	88	Lumber pine decline-multiple agents	Lumber Pine	224	Discoloration (hardwood)	Hardwoods
31	Heterobasidion annosum (Fomes annosus)	Softwoods	89	Unknown	Unknown	225	Discoloration (oak)	Oak
32	Armillaria ostoyae (Armillaria mellea)	Softwoods	90	Unknown	Unknown	226	Discoloration (spruce)	Spruce
33	Polyphaga schweinfurthii	Softwoods	91	Unknown	Unknown	230	Herbicide (cottonwood)	Cottonwood/Poplar
34	Phomopsis	Softwoods	92	Unknown	Unknown	231	Herbicide (eastern cedar)	Eastern Red Cedar
35	Cytospora	All Tree Species	93	Unknown	Unknown	232	Flagging (hardwood)	Hardwoods
36	Western gall rust	Unknown	94	Unknown	Unknown	233	Unidentified defoliator (cottonwood)	Cottonwood/Poplar
37	Comandra rust	Unknown	95	Unknown	Unknown	234	Unidentified defoliator (spruce)	Spruce
38	Shedleaf rust	Lodgepole Pine	96	Unknown	Unknown	235	Unidentified defoliator (hardwood)	Hardwoods
39	Unknown	Unknown	97	Unknown	Unknown	236	Mortality (pine)	Pine

USGS 100K Quad - Location Map

Legend

Flown Area in 2006

State Boundaries

Counties

How Aerial Surveys Are Conducted

Data represented on this map are based on aerial observations manually recorded onto a map. This procedure is considered both an art form and a form of scientific data collection, and is highly subjective. An observer only has a few seconds to recognize the color difference between healthy and damaged trees of different species; diagnose causal agents correctly; estimate intensity; delineate the extent of damage; and precisely record this information on a georeferenced map. Air turbulence, cloud shadows, distance from aircraft, haze, smoke, and observer experience can all affect the quality of the survey. These data summaries provide an estimate of conditions on the ground and may differ from estimates derived by other methods.

Aerial surveys provide information on the current status for many causal agents, and are important when examining insect activity trends by comparing historical and current survey data over large areas.

Overview surveys are a snap shot in time and therefore may not be timed to accurately capture the true extent or severity of a particular disturbance activity. Aerial surveys can be thought of as the first stage in a multi-stage sampling design. Other remote sensing approaches, including aerial photography, electro-optical sensors, and specially designed aerial surveys with modified flight patterns, can be used to more accurately delineate the extent and severity of a particular disturbance agent. The preceding methods are often more costly than overview surveys, and are generally reserved to address situations of sufficient environmental, economic, or political importance.

Area surveyed by Al Dymerski 07/10/2006

Map Created: 01/19/2007

Projection: UTM NAD83 Zone 13

Author: J. Ross, USDA Forest Service

DIRECT ALL INQUIRIES TO:

Resource Conservation and Forestry Division
3305 1/2 West South Street
Rapid City, SD 57702 - 8160

USDA Forest Service, Region 2
Renewable Resources
Forest Health Management
PO Box 25127
Lakewood, Colorado 80225

****DISCLAIMER****

Due to the nature of aerial surveys, the data on this map will only provide rough estimates of location, intensity and the resulting trend information for agents detectable from the air. Many of the most destructive diseases are not represented on this map because these agents are not detectable from aerial surveys. The data presented on this map should only be used as a partial indicator of insect and disease activity, and should be validated on the ground for actual location and causal agent. Shaded areas show locations where tree mortality or defoliation were apparent from the air. Intensity of damage is variable and not all trees in shaded areas are dead or defoliated.

The insect and disease data represented on this map are available digitally from the USDA Forest Service, Region Two Forest Health Management group. The cooperators reserve the right to correct, update, modify or replace GIS products. Using this map for purposes other than those for which it was intended may yield inaccurate or misleading results.

A data dictionary and digital copies of this map and the insect and disease data are available at: <http://www.fs.fed.us/r2/resources/fhm/aerialsurvey/>